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**Fisk-Gloeckler Suprathermal Proton Spectrum in the
Heliosheath and the Local Interstellar Medium**

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NASA Goddard Space Flight Center — Convergence of suprathermal
keV-MeV proton and ion spectra approximately to the Fisk-Gloeckler
(F-G) form $j(E) = j_0 E^{-1.5}$ in Voyager 1 and 2 heliosheath measure-
ments is suggestive of distributed acceleration in Kolmogorov turbulence
, which may extend well beyond the heliopause into the local interstellar
medium (LISM). Turbulence of this type is already indicated by inter-
stellar radio scintillation measurements of electron density power spec-
tra. Previously published extrapolations (Cooper et al., 2003, 2006) of
the LISM proton spectrum from eV to GeV energies are highly consistent
with the F-G power-law and further indicative of such turbulence and
LISM effectiveness of the F-G cascade acceleration process. The LISM
pressure computed from this spectrum well exceeds that from current
estimates for the LISM magnetic field, so exchange of energy between
the protons and the magnetic field would likely have a strong role in
evolution of the turbulence as per the F-G theory and as long ago pro-
posed for cosmic ray energies by Parker and others. Pressure-dependent
estimates of the LISM field strength should not ignore this potentially
strong and even dominant contribution from the plasma. Presence of
high-beta suprathermal plasma on LISM field lines could significantly af-
fect interactions with the heliospheric outer boundary region and might
potentially account for distributed and more discrete features in ongoing
measurements of energetic neutral emission from the Interstellar Bound-
ary Explorer (IBEX) mission.

Abstract

Limit

- ☒ Prefer Oral Session
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